Green Building at Vanderbilt University

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Keith Loiseau AIA, CCS, LEED AP
Real Estate’s Latest Movement

Build Green, Make Green

The Greening of America’s Campuses

It’s Easy Being Green
U.S. Building Impacts:

- 12% water use
- 39% CO₂ emissions
- 65% waste output
- 71% electricity consumption
The Average Green Building Saves:

- **Energy Savings**: 30%
- **CO2 Savings**: 35-50%
- **Water Use Savings**: 35-50%
- **Waste Cost Savings**: 50-90%
What is green building?

Design and construction practices that meet specified standards, resolving much of the negative impact of buildings on their occupants and on the environment.
The Triple Bottom Line

Reduced Environmental Impact.
Peak Efficiency.
Improved Capitalization Rates.
Increased Marketability.
Higher Lease Rates.
Improved Productivity.
Reduced Absenteeism.
Improved Bottom Line.

30-70% ENERGY SAVINGS

VERIFIED PERFORMANCE

ENHANCED PRODUCTIVITY

INCREASED VALUE

REDUCED LIABILITY & IMPROVED RISK MANAGEMENT

INCREASED VALUE
What is the LEED System?

Scores are tallied for different aspects of efficiency and design in appropriate categories.

For instance, LEED assesses in detail:

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation & Design Process

LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying DESIGN, CONSTRUCTION, & OPERATIONS of the greenest buildings in the world.
Traditional Building at Vanderbilt

- Long term owner
- Quality construction
- Durable materials
- Central utilities
- Focus on energy efficiency and maintainability
Green Building Principles First Used

- Sustainable buildings are just good design
- A holistic approach considering many design aspects
- Integrating building systems
- Featheringill Hall started design in 1998
Featheringill Hall

- Major building reuse
- Natural daylight in most spaces
- Healthy finishes and materials
- All offices have views and operable windows
- Efficient HVAC
- Not LEED certified
Typical Campus Building Close to LEED

• An analysis of typical University building practices showed that they are near to LEED certified standards.

• LEED standards could be achieved through early planning and a focused approach without major cost increases.
Vanderbilt Transitions to LEED Buildings

• Students requested LEED certified buildings

• Sustainable design and construction practices have become more mainstream

• Healthy building products have become more cost neutral

• 3rd party verification ensures quality performance
The Commons

• Opening in 2008
• 1600 first year students living with faculty
• Extended learning in the living environment
• Connecting academic and student life through special programs, lectures and dining together
The Commons Site

- 5 new residence houses
- 5 renovated residence houses
- Commons Center
- New utility infrastructure and chiller plant
Sutherland and Crawford LEED Silver
Finishes

- Recycled glass in terrazzo floors
- Renewable bamboo floors
- Low VOC paints, adhesives and sealants
Student Rooms

• Individual temperature controls
• Exterior daylight and views
• Operable windows
The Site

- Pervious pavement
- Storm water treatment
- Native landscaping
The Commons Center

- 580 seat dining hall
- Commons community space
- Meeting rooms
- Market and cafe
- Academic support center
- Group study space
- Exercise and recreation room
- Post office
- Copy center
- Shell floor space for future programs
### Sustainable Sites

<table>
<thead>
<tr>
<th>Credit</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site Selection</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Development Density (LEED v2.2)</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Brownfield Redevelopment</td>
<td>2</td>
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<tr>
<td>4</td>
<td>Alt. Trans., Public Transportation Access</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Alt. Trans., Bicycle Storage &amp; Changing Rooms</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Alt. Trans., Alternative Fuel Vehicles</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Alt. Trans., Parking Capacity and Carpooling</td>
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</tr>
<tr>
<td>8</td>
<td>Reduced Site Disturbance, Open Spaces</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Reduced Site Disturbance, Development Footprint</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Stormwater Management, Rate and Quantity</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Stormwater Management, Treatment</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Reduce Heat Islands, Non-Roof</td>
<td>2</td>
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<tr>
<td>13</td>
<td>Reduce Heat Islands, Rooftop</td>
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<tr>
<td>14</td>
<td>Light Pollution Reduction</td>
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### Materials & Resources

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<th>Credit</th>
<th>Description</th>
<th>Points</th>
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<tbody>
<tr>
<td>1</td>
<td>Storage &amp; Collection of Recyclables</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Building Reuse (not applicable)</td>
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<tr>
<td>3</td>
<td>Construction Waste Management, Divert 50%</td>
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<tr>
<td>4</td>
<td>Construction Waste Management, Divert 75%</td>
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<tr>
<td>5</td>
<td>Resource Reuse, Specify 5%</td>
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<tr>
<td>6</td>
<td>Resource Reuse, Specify 10%</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Recycled Content, Specify 5%</td>
<td>1</td>
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<tr>
<td>8</td>
<td>Recycled Content, Specify 10%</td>
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<tr>
<td>9</td>
<td>Local/Regional Materials, 20% Local</td>
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<tr>
<td>10</td>
<td>Local/Regional Materials, 50% Local</td>
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<tr>
<td>11</td>
<td>Local/Regional Materials, 20%, 50% Harvest</td>
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<tr>
<td>12</td>
<td>Rapidly Renewable Materials</td>
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<tr>
<td>13</td>
<td>Certified Wood</td>
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### Indoor Environmental Quality

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<th>Description</th>
<th>Points</th>
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<tbody>
<tr>
<td>1</td>
<td>Minimum IAQ Performance</td>
<td>2</td>
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<tr>
<td>2</td>
<td>Environmental Tobacco Smoke Control</td>
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### Water Efficiency

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<th>Credit</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Water Efficient Landscaping, Reduce by 50%</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Water Efficient Landscaping, No Potable Use</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Innovative Wastewater Technologies</td>
<td>2</td>
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<tr>
<td>4</td>
<td>Water Use Reduction, 20% Reduction</td>
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</tr>
<tr>
<td>5</td>
<td>Water Use Reduction, 30% Reduction</td>
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### Energy & Atmosphere

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<tr>
<td>1</td>
<td>Fundamental Building Commissioning</td>
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<tr>
<td>2</td>
<td>Minimum Energy Performance</td>
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<tr>
<td>3</td>
<td>CFC Reduction in HVAC&amp;R Equipment</td>
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<tr>
<td>4</td>
<td>Optimize Energy Performance</td>
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<tr>
<td>5</td>
<td>Renewable Energy, 5%</td>
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</tr>
<tr>
<td>6</td>
<td>Renewable Energy, 10%</td>
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<tr>
<td>7</td>
<td>Renewable Energy, 20%</td>
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<td>Additional Commissioning</td>
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<td>9</td>
<td>Ozone Depletion</td>
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<tr>
<td>10</td>
<td>Measurement &amp; Verification</td>
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### Innovation & Design Process

<table>
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<th>Description</th>
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<tr>
<td>1</td>
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### Project Totals (pre-certification estimates)

<table>
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<tr>
<th>Certification</th>
<th>Points</th>
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<tbody>
<tr>
<td>Certified</td>
<td>25-32</td>
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<tr>
<td>Silver</td>
<td>33-38</td>
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<tr>
<td>Gold</td>
<td>39-55</td>
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<tr>
<td>Platinum</td>
<td>56-69</td>
</tr>
</tbody>
</table>

(Credits highlighted yellow are "Campus")
Sustainable Sites
Reclaimed Land

Before

After
Alternative Transportation
3rd Floor Shell Space
Water Efficiency

The Commons Center will save an estimated 900,000 gallons of potable per year.
Proximity Sensor Faucets
Waterless Urinals
Dual Flush Toilets
Dish Water Conservation
Energy and Atmosphere

The Commons Center saves 28% of the energy used by similar buildings.
High Performance Glass
Daylight Harvesting
Efficient Kitchen Hoods
High Efficiency lighting
Ozone Friendly Refrigerants
Materials and Resources
Reused Sandstone Pavers
Reused Library Chairs
Regional Materials Within 500 Miles
Recycling
Recycled Content in Materials
Indoor Environmental Quality
Construction IAQ Management Plan
Smoke Free Building
Low VOC Adhesives and Paints
Innovation and Design
HVAC Condensate Collection
LEED-certiﬁed

View The Commons Center Overview
Operational Benefits
Hard China
Healthy Lifestyles
Cardboard Baler
Biodiesel
Pulper
The Common Center Project Team

Owner - Vanderbilt University
Architect – Bruner/Cott & Associates
MEP Engineers – Smith Seckman Reid Inc.
Structural Engineers – EMC Structural Engineers PC
Civil Engineers – Barge Cauthen & Associates
LEED Consultant and Commissioning – SSR,Cx
Construction Manager – Hardaway Construction Company
Increased Community Awareness

- Student and faculty tours
- Student workshop grants for sustainable living
- Commons development documentary
- Design and construction teams spread of experience through the industry.
Lessons Learned?

- Start LEED planning early in the project
- Work with a motivated and qualified team
- Check progress and get documentation throughout the process.
More Information

• www.vanderbilt.edu/sustainvu
• www.vanderbilt.edu/thecommons
• http://www.usgbc.org